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MANITOWOC PUBLIC UTILITIES

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January 29, 2001

Jim Loock, Chief Electric Engineer
Public Service Commission
610 N. Whitney Way
P.O. Box 7854
Madison, WI 53707-7854

RE: In the Matter of Filing Plans for Appropriate Inspection and Maintenance, PSC Rule 113.0607.

Dear Mr. Loock:

Enclosed for filing are 3 copies of Manitowoc Public Utilities' Preventative Maintenance Plan detailing inspection maintenance schedules, condition rating criteria, corrective action schedules, record keeping procedures and report filing schedules as documented in this rule.

Very truly yours,

Kevin R. Carr

Kevin R. Carr
Electrical Engineer

Enclosures

PREVENTATIVE MAINTENANCE PLAN

Manitowoc Public Utilities

FILING DEADLINE

FEBRUARY 1, 2001

December 19, 2000

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RECEIVED

JAN 3 1 2001

Electric Division

This plan was prepared by the MEUW work group for PSC Rule 113.0607 for use by the 82 municipal electric utilities in Wisconsin and endorsed by PSC staff as meeting the requirements of Rule PSC 113.0607.

TABLE OF CONTENTS

I. Preventative Maintenance Plan

The PSC 113.0607 rule reads;

Appropriate inspection and maintenance: system reliability.

(1) PREVENTATIVE MAINTENANCE PLAN. Each utility or other person subject to this chapter, including persons who own electric generating facilities in this state who provide service to utilities with contracts of five years or more, shall develop and have in place its own preventative maintenance plan. This section is applicable to electric generating facilities as set forth at s. 194.491(5)(a)(1), Stats. Each plan shall include, among other things, appropriate inspection, maintenance and replacement cycles where applicable for overhead and underground distribution plant, transmission, generation[1], and substation facilities.

(2) CONTENTS OF THE PLAN. (a) *Performance standard.* The Preventative Maintenance Plan shall be designed to ensure high quality, safe, and reliable service, considering: cost, geography, weather, applicable codes, national electric industry practices, sound engineering judgment and experience.

1 *PSC staff interpretation is that generation applies to individual generators equal to or greater than 50 MW.*

II. Inspection Schedule and Methods:

The purpose of this plan is to maintain or improve the electrical system reliability with the objective of increased municipal loyalty and satisfaction from our constituents. The goals are to meet and exceed the schedules established in this plan.

Exception reporting (inspected equipment not in good condition) will be the method of documentation on all inspection forms.

The scope of this plan is traditional and uses proven maintenance techniques. Unique operating and maintenance philosophies have not been considered. Also, manufacturer defects will be dealt with as they are communicated to this utility.

SCHEDULE:	MONTHLY	ANNUAL	EVERY 5 YEARS
Transmission (≥69Kv and above)		X	X
Substations	X	X	
Distribution (OH & UG)			X

The inspection of Distribution facilities will be by individual substation circuits on a 5-year cycle such that the entire system will be inspected every 5 years. Inspector instructions for inspecting all facilities and forms are included with the plan.

METHODS: Five criteria groups will be used to complete the inspection of all facilities.

1. IR – infrared thermography used to find poor electrical connections and/or oil flow problems in equipment.
2. RFI - Radio Frequency Interference, a byproduct of loose hardware and connections, is checked using an AM radio receiver.
3. SI – structural integrity of all supporting hardware including poles, crossarms, insulators, structures, bases, foundations, buildings, etc.
4. Clearance – refers to proper spacing of conductors from objects, trees and other utility cables.
5. EC – equipment condition on non-structural components such as circuit breakers, transformers, regulators, reclosers, relays, batteries, capacitors, etc.

III. Condition Rating Criteria:

This criterion, as listed below, establishes the condition of a facility and also determines the repair schedule to correct deficiencies.

0) Good condition

1) Good condition but aging

2) Non-critical maintenance required – normally repair within 12 months

3) Priority maintenance required – normally repair within 90 days

4) Urgent maintenance required – report immediately to the utility and repair normally within 1 week

IV. Corrective Action Schedule

The rating criteria as listed above determine the corrective action schedule.

V. Record Keeping

All inspection forms and records will be retained for a minimum of 10 years. The inspection form contains all of the required critical information i.e. inspection dates, condition rating, schedule for repair and date of repair completion.

VI. Reporting Requirements

A report and summary of this plan's progress will be submitted every two years with the first report due to the Commission by February 1, 2003. The report will consist of a letter documenting the percent of inspections achieved compared to the schedule and a description of maintenance achieved within the scheduled time allowance.

VII DISTRIBUTION – OVERHEAD INSPECTION GUIDE

STRUCTURE

- Pole Condition
- Pole Leaning
- Crossarm Condition
- Insulators, Deadend, Pin
- Excess Fill or Soil Removal
- Pole Steps
- Grounds Intact
- Ground Molding
- Down Guys
- Guy Markers
- Guy Bonding/Insulator
- Signage - Location Number, Warning Sign
- Customer Equipment
- Conductor
- Tie Wires
- U Guard/Conduit Condition

EQUIPMENT

- Transformers
  - ✓ Oil Leaks
  - ✓ Bushing Condition
  - ✓ Grounding/Bonding
- Capacitors
  - ✓ Fuses Blown
  - ✓ Bushing Condition
  - ✓ Oil Leaks
  - ✓ Tank Bulged
  - ✓ Switches, Oil, Vacuum
  - ✓ Control Conduit/Wiring
  - ✓ Grounding/Bonding
- Switches - GOAB, Inline, Disconnect
  - ✓ Insulator Condition
  - ✓ Operating Handle/Locks
  - ✓ Linkage
  - ✓ Grounding/Bonding
  - ✓ Switch Number
- Cutouts
  - ✓ Insulator Condition
  - ✓ Fuse Size Tag

VII DISTRIBUTION – OVERHEAD INSPECTION GUIDE (con't)

EQUIPMENT (CON'T)

- Arrestor
  - ✓ Insulator Condition
  - ✓ Connections
  - ✓ Ground Lead Disconnection
- Cable Terminators
  - ✓ Insulator Condition
  - ✓ Grounding/Bonding

CLEARANCES

- Ground Line
- Buildings, Bridges, Swimming Pool, Etc.
- Communications Facilities
- Fuel Tanks
- Other Electric Utilities
- Transmission Lines
- Over Streets, Roads, Alleys, Highways
- Tree Trimming
  - ✓ Clearance From Line
  - ✓ Vines on Poles
  - ✓ Danger Trees

INFRARED SCAN

- Main Three-Phase Feeders
- Priority Overhead Transformer Banks
  - ✓ Bushing Connectors Primary
  - ✓ Bushing Connectors Secondary
  - ✓ General Tank Heating
- Current & Voltage Transformers if Applicable

RFI CHECK

- OH system with AM radio as each circuit is inspected

VIII DISTRIBUTION – UNDERGROUND INSPECTION GUIDE

STRUCTURAL (Exterior & Interior) Transformer, Primary Pedestal, Secondary Pedestal, Switchgear.

- Enclosure Condition
- Level/Leaning
- Security
- Grade/Accessibility (Shrubs, Customer Facilities, Fill/Excavation)
- Numbering
- Voids/Gaps
- Signage - Location Number, Warning Sign
- Pad/Vault Condition

EQUIPMENT

- Transformers
  - ✓ Oil Leaks
  - ✓ Bushing Condition
  - ✓ Grounding/Bonding
  - ✓ Elbows
  - ✓ Arrestors
  - ✓ Feed-Through
  - ✓ Cable Condition
  - ✓ Secondary Connections
- Primary Pedestals
  - ✓ Elbows
  - ✓ Junction Condition
  - ✓ Grounding/Bonding
- Secondary Pedestals
  - ✓ Secondary Connections
- Switches – URD Switchgear
  - ✓ Insulator Condition
  - ✓ Operating Handle Security
  - ✓ Linkage
  - ✓ Grounding/Bonding
  - ✓ Switch Number/Fuse Size & Number

INFRARED SCAN and RFI CHECK

- Main Three-Phase Feeders (Risers & Switchgear)
- Priority URD Transformer Banks
  - ✓ Bushing Connectors Primary
  - ✓ Bushing Connectors Secondary
  - ✓ General Tank Heating

IX SUBSTATION - MONTHLY INSPECTION GUIDE

TRANSFORMER MAIN TANK:

- Oil in bushings
- Bushing and arrestor porcelain
  - ✓ Cracks or chips
  - ✓ Rust or dirt
- Oil leaks
  - ✓ Main tank
  - ✓ Sample valves
  - ✓ Radiators
- Radiator bank
  - ✓ warm on top, cool at bottom
- Tank pressure
- Tank oil level
- Temperature gauge
- Cooling fans

TRANSFORMER LTC or VOLTAGE REGULATORS:

- Tank oil level
- Drag hand positions
- Cabinet light
- Operation count
- Tank pressure
- Cabinet heater
- Cabinet contamination

TRANSMISSION CIRCUIT BREAKERS:

- OPEN/CLOSED indicator
- CHARGED/DISCHARGED indicator
- Cabinet light
- Cabinet heater
- Operations counter
- Bushings and supports
  - ✓ Cracks or chips
  - ✓ Rust or dirt
- Line and load side disconnect switches
  - ✓ Properly labeled
  - ✓ Aligned properly
- Handles grounded
- Emergency trip button
- Air / Oil compressors
- Air / Oil pressure gauge
- Spring operated mechanism
- Oil level gauge
- Tank oil leaks
- Reset switch
- Cabinet contamination
- Vents clean
- Gas pressures for GCBs

IX SUBSTATION - MONTHLY INSPECTION GUIDE (con't)

FEEDER CIRCUIT BREAKERS / RECLOSERS

- OPEN/CLOSED indicator
- CHARGED/DISCHARGED indicator
- Cabinet light
- Cabinet heater
- Operations counter
- Bushings and supports
  - ✓ Cracks or chips
  - ✓ Rust or dirt
- Line and load side disconnect switches
  - ✓ Labeled properly
  - ✓ Aligned properly
  - ✓ Handles grounded
- Emergency trip button
- Oil level gauge
- Tank oil leaks
- Reset switch
- Cabinet contamination
- Vents clean
- Gas pressures for GCBs

HIGH AND LOW VOLTAGE BUSS WORK:

- Bushing, insulator, arrestor, and support insulators
  - ✓ Chips or cracks
  - ✓ Rust or dirt
- Bird nests
- Potential transformers bushings
  - ✓ Cracks or chips
  - ✓ Rust or dirt
- Cable terminators
  - ✓ Leaking fluid
  - ✓ Cracks or chips

MANUAL SWITCHES:

- Properly labeled
- Ground connections
- Positioning and alignment
- Bushing and support insulators
  - ✓ Cracks or chips
  - ✓ Rust or dirt

MOTOR OPERATED SWITCHES:

- OPEN/CLOSED indicator
- Properly labeled
- Cabinet heater
- Operations counter

IX SUBSTATION - MONTHLY INSPECTION GUIDE (con't)

CONTROL HOUSE/MISCELLANEOUS:

- Clock displays proper time
- AC/DC load center breakers
- Room temperature
- Rodents
- Panels labeled properly
- Panel lights
- Annunciator panel
- Panel meters
- SCADA system RTU
- SCADA alarms
- Position indicators agree
- Relay target information
- Emergency contact directory & dial tone for phone
- Safety Equipment

BATTERY:

- Liquid levels
- Proper float voltage on charger and battery
- Specific gravity in pilot cell
- Personal Protective Equipment
- Connection corrosion
- Leaking cells
- Dated solution in eyewash station

YARD AND FENCE:

- Fire extinguisher charged
- Fence ground connections
- Fence secured
- Security and emergency lights
- Site base and grade
- Standing water
- Warning signs

X Substation - Annual Inspection Guide

- Check equipment for level
- Check condition of concrete pads
- Perform oil and DGA analysis
- Battery
  - ✓ Intercell strap resistance
  - ✓ Individual cell voltages
  - ✓ Cell specific gravity
- Nameplate legible
- Equipment paint condition
- Proper equipment ID labels
- IR / RFI scans and checks

XI TRANSMISSION – ANNUAL INSPECTION GUIDE

STRUCTURE

- Pole Condition
- Pole Leaning
- Crossarm Condition
- Insulators, Deadend, Pin
- Excess Fill or Soil Removal
- Pole Steps
- Grounds Intact
- Ground Molding
- Down Guys
- Guy Markers
- Guy Bonding/Insulator
- Signage - Location Number, Warning Sign
- Customer Equipment
- Conductor
- Tie Wires

EQUIPMENT

- Switches - GOAB, Disconnect
  - ✓ Insulator Condition
  - ✓ Operating Handle/Locks
  - ✓ Linkage
  - ✓ Grounding/Bonding
  - ✓ Switch Number
- Arrestor
  - ✓ Insulator Condition
  - ✓ Connections

CLEARANCES

- Ground Line
- Buildings, Bridges, Etc.
- Communications Facilities
- Fuel Tanks
- Other Electric Utilities
- Over Streets, Roads, Alleys, Highways
- Tree Trimming
  - ✓ Clearance From Line
  - ✓ Vines on Poles
  - ✓ Danger Trees

XI TRANSMISSION – ANNUAL INSPECTION GUIDE (con't)

RFI CHECK

- Splices
- Connectors
- Dead Ends
- Switches
- Structures

XII TRANSMISSION – 5 YEAR INSPECTION GUIDE

IR SCAN

- Splices
- Connectors
- Dead Ends
- Switches

APPENDIX A

Overhead Distribution Inspection Form

MPU OVERHEAD DISTRIBUTION INSPECTION FORM

Date_____ **Inspected by**_____ **Sub**_____ **Ckt** _____

MAP AREA	STRUCTURE													EQUIPMENT							CLEARANCE					COMMENTS		
LOCATION	Pole Condition/Leaning	Crossarm Condition	Insulators, DE, Pin	Soil Conditions	Pole Steps	Grounds Intact, Molding	Down Guys and Markers	Guy Bond, Insulator	Signs, Loc#, Warning	Customer Equipment	Conductor and Ties	U'Guard/Conduit Cond	RFI Check	Transformer	Switches	Cutouts	Arresters	Terminators	Capacitors	Street Light	Tree Trimming	Ground Line Clearances	Building Clearances	Streets, Roads, Alleys	Communication Clearance	Rating Criteria 0) Good Condition 1) Good Condition but aging 2) Non-critical Maintenance Required 3) Priority Maintenance Required 4) Urgent Maintenace Required	Date Item Corrected	Corrected By

MEUW - Preventative Maintenance Plan Format

APPENDIX B

Underground Distribution Inspection Form

UNDERGROUND DISTRIBUTION INSPECTION FORM Date_____Inspected by_____ Sub_____ Circuit_____

MAP AREA	STRUCTURE								EQUIPMENT				IR / RFI Scan		COMMENTS		
EQUIPMENT LOCATION	Enclosure Condition	Level / Leaning	Security	Grade / Accessibility	Numbering	Voids / Gaps	Signage	Pad / Vault Condition	**Transformers**, Leaks, Bushings, Grounding,Bonds,Elbows, Arrestors, Cable cond, Connections	**Primary Pedestals**, Elbows, Grounding, Bonds,Junction cond.	**Secondary Pedestals**, Connections	**Switches**, Signage, Insulators, Security, Linkage, Ground, Bonds	**Main Three Phase Feeders**, Risers & Switchgear	**Priority URD Transformers**, Bushings and Tank heating	Rating Criteria --- 0) Good Condition 1) Good Condition but aging 2) Non-critical Maintenance Required 3) Priority Maintenance Required 4) Urgent Maintenace Required	Date Item Corrected	Corrected By

APPENDIX C

Monthly Substation Inspection Forms

- Custer Substation
- Revere Substation
- Northeast Substation
- Lakefront Substation
- Mirro Substation
- Rapids Substation
- 'A' Substation

Route: Dick Blashka
Kevin Carr
Kim Hackelberg (file)

Rating Criteria: 0 - Perfect Condition
1 - Good Condition, but aging
2 - Non-critical maintenance needed (normally repair within 12 months)
3 - Priority maintenance needed (normally repair within 90 days)
4 - Urgent maintenance needed (report immediately and repair within 1 week)

MPU Custer Substation - Monthly Inspection Form

INSPECTED BY:

DATE:

TEMPERATURE:

	Good	Bad	COMMENTS	DATE CORRECTED	CORRECTED BY
Transformer Bank #2 Main Tank			**RATING: 0 1 2 3 4**	**(Circle One)**	
Tank oil level is halfway between high and low marks					
Bushing and arrestor porcelain is not damaged or dirty					
Tank pressure is between 1 & 4 pounds positive					
No oil leaks from main tank, radiators, valves					
Cooling fans work when placed in manual					
Record temperature gauge peaks and reset hands					
Radiator temperature increases from bottom to top					
Bushing oil level is halfway up sight glass					
Transformer Bank #2 LTC			**RATING: 0 1 2 3 4**	**(Circle One)**	
Oil level is halfway between high and low marks					
Record temperature drag hand positions and reset					
Cabinet light works					
Record LTC operation counter & update card					
Record LTC position peaks and reset					
Cabinet heater works below 60 deg F.					
Beckwith LTC backup control Block Raise/Lower lamps display dim rather than bright					
86RL LTC lockout alarm light is OFF					
86GL LTR SUPV light is lit					
"OK" LED on the M-2001 tap changer control is lit					
No signs of cabinet contamination					
LTC tank pressure between 1&4 pounds positive					
A-101 69 kV Gas Circuit Breaker			**RATING: 0 1 2 3 4**	**(Circle One)**	
The Emergency trip switch is labeled and painted red					
The control door is clearly labeled A-101 GCB					
The position indicator displays the "Closed" position					
The gas pressure is within limits for current temperature					
The Charged/Discharged flag is clearly visible					
The emergency trip reset "69" switch is labeled & reset					
The cabinet light works					
The cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					
A-101 GCB Line Side disconnect switch is clearly labeled					
A-101 GCB Line Side disconnect switch is grounded					
A-101 GCB Line Side disconnect switches are fully closed and properly aligned					
A-101 GCB Buss Side disconnect switch is clearly labeled					
A-101 GCB Buss Side disconnect switch is grounded					
A-101 GCB Buss Side disconnect switches are fully closed and properly aligned					

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
69 kV Buss			**RATING: 0 1 2 3 4**	**(Circle One)**	
The porcelain bushings, buss supports, and switch posts are not damaged or dirty					
69 kV 299 Disconnect Switch			**RATING: 0 1 2 3 4**	**(Circle One)**	
299 Disconnect switch is clearly labeled and grounded					
299 Disconnect switches are fully closed & aligned					
Porcelain insulators & supports are not damaged or dirty					
69 kV Circuit Switcher			**RATING: 0 1 2 3 4**	**(Circle One)**	
Position indicator labeling and external position indicator displays the appropriate Open/Closed position					
Control door is clearly labeled "299 Circuit Switcher"					
Gas pressure is within limits for the current temperature					
The Remote/Local switch is in Remote					
Record the operations counter & update card					
Cabinet lights work					
Cabinet heaters work below 60 deg F.					
Cabinet is free from contamination					
266 Switch & 13.2 kV Buss			**RATING: 0 1 2 3 4**	**(Circle One)**	
266 disconnect switch is clearly labeled and grounded					
266 disconnect switches are fully closed & aligned					
Porcelain insulators & supports are not damaged or dirty					
52L VCB			**RATING: 0 1 2 3 4**	**(Circle One)**	
The porcelain bushings, buss supports, and switch posts are not damaged or dirty					
Disconnect switches are clearly labeled and grounded					
Disconnect switches are fully closed & aligned					
The cabinet door is clearly labeled "52L VCB"					
The Emergency trip switch is labeled and painted red					
The indicator displays the correct Open/Closed position					
The yellow indicator is in the Charged position					
Record the operations counter & update card					
Cabinet heaters work below 60 deg F.					
Cabinet is free from contamination					
The LCD windows display the following:					
DPU status is green					
Pickup LED is NOT lit					
Recloser disable LED is lit					
Record any target information					
Yard & Fence			**RATING: 0 1 2 3 4**	**(Circle One)**	
Two west flood lights operate by switch in control house					
Two east flood lights operate by switch on each pole					
Fire extinguisher is mounted on the fence and charged					
The fence is secure from unathorized entry					
The fence ground connections are intact					
The structural steel is free of bird and insect nests					
Site base and grade is free of vegetation and water					
Warning signs are properly mounted on the fence					

	Good	Bad	COMMENTS	DATE CORRECTED	CORRECTED BY
	X	X			
C134 VCB			**RATING: 0 1 2 3 4**	**(Circle One)**	
The porcelain bushings, buss supports, and switch posts are not damaged or dirty					
Disconnect switches are clearly labeled and grounded					
Disconnect switches are fully closed & aligned					
VCB By-pass switches are open, labeled & aligned					
The cabinet door is clearly labeled "C134 VCB"					
The Emergency trip switch is labeled and painted red					
The indicator displays the correct Open/Closed position					
The yellow indicator is in the Charged position					
Record the operations counter & update card					
Cabinet heaters work below 60 deg F.					
The LCD windows display the following:					
DPU status is green					
Pickup LED is NOT lit					
Recloser disabled LED is NOT lit					
Record any target information					
C135 VCB			**RATING: 0 1 2 3 4**	**(Circle One)**	
The porcelain bushings, buss supports, and switch posts are not damaged or dirty					
Disconnect switches are clearly labeled and grounded					
Disconnect switches are fully closed & aligned					
VCB By-pass switches are open, labeled & aligned					
The cabinet door is clearly labeled "C135 VCB"					
The Emergency trip switch is labeled and painted red					
The indicator displays the correct Open/Closed position					
The yellow indicator is in the Charged position					
Record the operations counter & update card					
Cabinet heaters work below 60 deg F.					
The LCD windows display the following:					
DPU status is green					
Pickup LED is NOT lit					
Recloser disabled LED is NOT lit					
Record any target information					
C136 VCB			**RATING: 0 1 2 3 4**	**(Circle One)**	
The porcelain bushings, buss supports, and switch posts are not damaged or dirty					
Disconnect switches are clearly labeled and grounded					
Disconnect switches are fully closed & aligned					
VCB By-pass switches are open, labeled & aligned					
The cabinet door is clearly labeled "C136 VCB"					
The Emergency trip switch is labeled and painted red					
The indicator displays the correct Open/Closed position					
The yellow indicator is in the Charged position					
Record the operations counter & update card					
Cabinet heaters work below 60 deg F.					
The LCD windows display the following:					
DPU status is green					
Pickup LED is NOT lit					
Recloser disabled LED is NOT lit					
Record any target information					

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
Panel W1			**RATING: 0 1 2 3 4**	**(Circle One)**	
The Transformer Bank #2 INCON Position indicator displays the same position as the LTC indicator head					
The 299 breaker control RED lamp is lit					
A-101 synchroscope stops near 12:00 when on					
The A-101 breaker control RED lamps are lit					
The WHITE A-101 line indication lamp is lit					
Panel W2			**RATING: 0 1 2 3 4**	**(Circle One)**	
Using the digital panel meter verify the 13.2 kV buss voltage is between 124.0 - 126.0 volts					
Note any annunciator alarms and acknowledge					
The Panalarm Annunciator RED power on panel is lit					
All WHITE panels light up when pressing "Lamp Test"					
All WHITE panels light up when pressing "TEST"					
All WHITE panels go out when the ACK button is pressed					
Confirm the Plant Operator received the following alarms:					
Sub major, Circuit lockout, Switching device,					
Transformer major, LTC voltage limit, LTC lockout					
The RED C134, C135, C136 lamps are lit					
MPU Supv Panel			**RATING: 0 1 2 3 4**	**(Circle One)**	
The RED LED display read "ILEX"					
The RED LED's D1, D2, & D4 are blinking					
Panel W5			**RATING: 0 1 2 3 4**	**(Circle One)**	
The "Protection in Service" LED is lit on the A-10121 PC REL 302 Relay					
"EN" LED is lit on the A-101 21B/50BF SEL 221F-3 relay					
"EN" LED is lit on the SECT 2 87/5152 SEL 387 relay					
Record any target information					
Battery			**RATING: 0 1 2 3 4**	**(Circle One)**	
DC ammeter reads about 5 amps					
DC voltmeter on the charger measures 60 volts with the GRD TEST switch in + position					
DC voltmeter on the charger measures 60 volts with the GRD TEST switch in - position					
Liquid level in cells 1 - 58 is between LOW & HIGH level					
A full bottle with a current expiration date is available					
Face shield and specific gravity tester is available					
Specific gravity in the test cell is 1.200 after corrected					
NO sign of electrolyte leaks from the cells					
NO sign of corrosion on the intercell straps					
Float voltage on the charger and measured from the battery rack is 130.5 volts					

Control House / General	Good X	Bad X	COMMENTS RATING: 0 1 2 3 4	DATE CORRECTED (Circle One)	CORRECTED BY
The wall clock displays the proper time					
The AC load center breakers do not display trip flags					
The room temperature is between 60 - 80 degrees F.					
NO sign of rodent infestation					
Emergency Contact Directory present & phone dialtone					
Empty waste bin and sweep as required					
Place entry in log book and notify plant operator					

Other:

Operation Counts

Device	Previous	Present	Number of Operations
A-101 GCB			
299 Circuit Switcher			
52L Breaker			
C134 Breaker			
C135 Breaker			
C136 Breaker			
Trans. Bank #2 LTC			

Trans. Bank #2 Tank Pressure _____ PSIG

Trans. Bank #2 Winding Temp _____ Degree C spot _____ Degree C Max

Trans. Bank #2 Liquid Temp _____ Degree C spot _____ Degree C Max

Trans. Bank #2 Tank Oil Level	Low	25C	HIGH
Trans. Bank #2 LTC Oil Level	Low	25C	HIGH

Trans. Bank #2 LTC Limits: _____ Maximum

_____ Spot

_____ Minimum

Specific Gravity Tests

#1. Read the temperature corrrection factor off the thermometer (o.oo1 for each 3 deg. Difference from 77 deg. F)
#2. Draw a liquid sample with the syringe and read the specific gravity off the float.
#3. Subtract any negative corrrection from the third decimal of the specific gravity reading (for example: with a -4 correction at 65 deg F and a specific gravity of 1.213, the corrected specific gravity is 1.209)
#4. If the temperature is above 77 deg F, the correction factor must be added to the specific gravity (for example: with a +4 correction at 89 deg. F and a specific gravity of 1.213, the corrected specific gravity is 1.217)

To Record LTC Operation Count

#1. Press the "ENTER" key on the M-2001 relay in the LTC control cabinet
#2. Press the "UP ARROW" thirteen (13) times
#3. Record the value on the card in the cabinet and on the inspection report
#4. Press the "UP ARROW" until LCD display says "EXIT"
#5. Press the "ENTER" key to turn off the LCD display

Route: Dick Blashka
Kevin Carr
Kim Hackelberg (file)

Rating Criteria: 0 - Perfect Condition
1 - Good Condition, but aging
2 - Non-critical maintenance needed (normally repair within 12 months)
3 - Priority maintenance needed (normally repair within 90 days)
4 - Urgent maintenance needed (report immediately and repair within 1 week)

MPU Revere Substation - Monthly Inspection Form

INSPECTED BY:

DATE:

TEMPERATURE:

	Good	Bad	COMMENTS	DATE CORRECTED	CORRECTED BY
C-103 69 kV Oil Circuit Breaker			**RATING: 0 1 2 3 4**	**(Circle One)**	
Emergency trip switch is labeled and painted red					
Control door is clearly labeled C-103 OCB					
Position indicator displays the "Closed" position					
Charged/Discharged flag is clearly visible					
Emergency trip reset "69" switch is labeled & reset					
Cabinet light works					
Cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					
Red oil gauge on top is visible halfway up the glass					
Bushing oil is halfway up the sight glass					
No leaks from main tank or valves					
Record operation counter and update card					
Power resistor in the C-103 line pot fuse cabinet is warm					
Voltage between KLVO & KLVI in the line pot fuse cabinet is between 108 & 140 volts					
C-103 OCB Line Side disconnect switch is clearly labeled					
C-103 OCB Line Side disconnect switch is grounded					
C-103 OCB Line side disconnect switches are fully closed and properly aligned					
C-103 OCB Bus Side disconnect switch is clearly labeled					
C-103 OCB Bus Side disconnect switch is grounded					
C-103 OCB Bus side disconnect switches are fully closed and properly aligned					
Compressor ran less than 2 hours per month					
Air pressure is between 140 & 160 psi					
B-102 69 kV Oil Circuit Breaker			**RATING: 0 1 2 3 4**	**(Circle One)**	
Emergency trip switch is labeled and painted red					
Control door is clearly labeled B-102 OCB					
Position indicator displays the "Closed" position					
Charged/Discharged flag is clearly visible					
Emergency trip reset "69" switch is labeled & reset					
Cabinet light works					
Cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					
Red oil gauge on top is visible halfway up the glass					
Bushing oil is halfway up the sight glass					
No leaks from main tank or valves					
Record operation counter and update card					
Power resistor in the B-102 line pot fuse cabinet is warm					
Voltage between JLVO & JLVI in the line pot fuse cabinet is between 108 & 140 volts					
B-102 OCB Line Side disconnect switch is clearly labeled					

Approved

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
B-102 69 kV Oil Circuit Breaker, Cont.			**RATING: 0 1 2 3 4**	**(Circle One)**	
B-102 OCB Line Side disconnect switch is grounded					
B-102 OCB Line Side disconnect switch is clearly labeled					
B-102 OCB Line Side disconnect switch is grounded					
B-102 OCB Line side disconnect switches are fully closed and properly aligned					
B-102 OCB Bus Side disconnect switch is clearly labeled					
B-102 OCB Bus Side disconnect switch is grounded					
B-102 OCB Bus side disconnect switches are fully closed and properly aligned					
Hydraulic pump ran less than 2 hours per month					
Hydraulic pressure gauge is between 1800 & 2100 psi					
D-104 69 kV Oil Circuit Breaker			**RATING: 0 1 2 3 4**	**(Circle One)**	
Emergency trip switch is labeled and painted red					
Control door is clearly labeled D-104 OCB					
Position indicator displays the "Closed" position					
Charged/Discharged flag is clearly visible					
Emergency trip reset "69" switch is labeled & reset					
Cabinet light works					
Cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					
Red oil gauge on top is visible halfway up the glass					
No leaks from main tank or valves					
Record operation counter and update card					
Power resistor in the D-104 line pot fuse cabinet is warm					
Voltage between MLVO & MLVI in the line pot fuse cabinet is between 108 & 140 volts					
D-104 OCB Line Side disconnect switch is clearly labeled					
D-104 OCB Line Side disconnect switch is grounded					
D-104 OCB Line side disconnect switches are fully closed and properly aligned					
D-104 OCB Bus Side disconnect switch is clearly labeled					
D-104 OCB Bus Side disconnect switch is grounded					
D-104 OCB Bus side disconnect switches are fully closed and properly aligned					
69 kV Capacitor Bank			**RATING: 0 1 2 3 4**	**(Circle One)**	
Inspect all 30 units for leaks or bulges					
Inspect all units for tank cracks or flashovers					
Bushings and insulators are not damaged or dirty					
No blown fuses					
"FRAME ENERGIZED" Warning is clearly visible					
Frame is clear of bird or insect nests					
Wiring panel is free from contamination					
221 Breaker			**RATING: 0 1 2 3 4**	**(Circle One)**	
The Emergency trip switch is labeled and painted red					
The control door is clearly labeled 221 GCB					
The position indicator displays the "Closed" position					
The gas pressure is within limits for current temperature					
The Charged/Discharged flag is clearly visible					
The emergency trip reset "69" switch is labeled & reset					
The cabinet light works					
The cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
221 Disconnect Switch			**RATING: 0 1 2 3 4**	**(Circle One)**	
221 Disconnect switch is clearly labeled and grounded					
221 Disconnect switches are fully closed & aligned					
Porcelain insulators & supports are not damaged or dirty					
69 kV Buss & PT			**RATING: 0 1 2 3 4**	**(Circle One)**	
Oil level is primary bushings are between High & Low marks					
Bushings and insulators are not damaged or dirty					
Voltage between fuses & ground in 69 kV bus pot fuse box is between 62 & 76 volts					
399 Circuit Switcher			**RATING: 0 1 2 3 4**	**(Circle One)**	
Position indicator displays proper OPEN/CLOSED position					
No red target in the interrupter open sight window at north terminal end of each interrupter					
Sight window on side of brain housing has no "low pressure" target displayed					
Operator is locked in coupled position					
Cabinet heater is warm below 60 deg F					
Update counter card					
Cabinet and vents are free of contamination					
499 Circuit Switcher			**RATING: 0 1 2 3 4**	**(Circle One)**	
Position indicator displays proper OPEN/CLOSED position					
No red target in the interrupter open sight window at north terminal end of each interrupter					
Sight window on side of brain housing has no "low pressure" target displayed					
Operator is locked in coupled position					
Cabinet heater is warm below 60 deg F					
Update counter card					
Cabinet and vents are free of contamination					
Transformer Bank #3 Main Tank			**RATING: 0 1 2 3 4**	**(Circle One)**	
Tank oil level is halfway between high and low marks					
Bushing and arrestor porcelain is not damaged or dirty					
Tank pressure is between 1 & 4 pounds positive					
No oil leaks from main tank, radiators, valves					
Cooling fans work when placed in manual					
Record temperature gauge peaks and reset hands					
Radiator temperature increases from bottom to top					
Bushing oil level is halfway up sight glass					
Upper cooling fans run if temp gauge is above lowest contact					
Lower cooling fans run if temp gauge is above second contact					
Transformer Bank #3 LTC			**RATING: 0 1 2 3 4**	**(Circle One)**	
Oil level is halfway between high and low marks					
Record temperature drag hand positions and reset					
Cabinet light works					
Record LTC operation counter & update card					
Record LTC position peaks and reset					
Cabinet heater works below 60 deg F.					
Beckwith LTC backup control Block Raise/Lower lamps display dim rather than bright					
"OK" LED on the M-2001 tap changer control is lit					

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
Transformer Bank #3 LTC, Cont.			**RATING: 0 1 2 3 4**	**(Circle One)**	
No signs of cabinet contamination					
LTC tank pressure between 1&4 pounds positive					
Confirm integrity of the LTC vacuum bottles using the LTC test procedure					
LTC door is clearly labeled					
366 MOD & 13.2 kV Buss			**RATING: 0 1 2 3 4**	**(Circle One)**	
Motor operator displays proper OPEN/CLOSED position					
Operator is locked in coupled position					
Cabinet heater is warm below 60 deg F					
Update operations counter card					
Section 3 fused disc bus PT 13.8 kV fuse links are intact					
Cabinet and vents are free of contamination					
Transformer Bank #4 Main Tank			**RATING: 0 1 2 3 4**	**(Circle One)**	
Tank oil level is halfway between high and low marks					
Bushing and arrestor porcelain is not damaged or dirty					
Tank pressure is between 1 & 4 pounds positive					
No oil leaks from main tank, radiators, valves					
Cooling fans work when placed in manual					
Record temperature gauge peaks and reset hands					
Radiator temperature increases from bottom to top					
Bushing oil level is halfway up sight glass					
Upper cooling fans run if temp gauge is above lowest contact					
Lower cooling fans run if temp gauge is above second contact					
Transformer Bank #4 LTC			**RATING: 0 1 2 3 4**	**(Circle One)**	
Oil level is halfway between high and low marks					
Record temperature drag hand positions and reset					
Cabinet light works					
Record LTC operation counter & update card					
Record LTC position peaks and reset					
Cabinet heater works below 60 deg F.					
Beckwith LTC backup control Block Raise/Lower lamps display dim rather than bright					
"OK" LED on the M-2001 tap changer control is lit					
No signs of cabinet contamination					
LTC tank pressure between 1&4 pounds positive					
Confirm integrity of the LTC vacuum bottles using the LTC test procedure					
LTC door is clearly labeled					
466 MOD & 13.2 kV Buss			**RATING: 0 1 2 3 4**	**(Circle One)**	
Motor operator displays proper OPEN/CLOSED position					
Operator is locked in coupled position					
Cabinet heater is warm below 60 deg F					
Update operations counter card					
Section 3 fused disc bus PT 13.8 kV fuse links are intact					
Cabinet and vents are free of contamination					

	Good	Bad	COMMENTS	DATE CORRECTED	CORRECTED BY
	X	X			
R131 OCB Feeder			**RATING: 0 1 2 3 4**	**(Circle One)**	
Emergency trip switch is labeled and painted red					
Control door is clearly labeled R131 OCB					
Position indicator displays the "Closed" position					
Charged/Discharged flag is clearly visible					
Emergency trip reset "69" switch is labeled & reset					
Cabinet light works					
Cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					
Bushing oil is halfway up the sight glass					
No leaks from main tank or valves					
Record operation counter and update card					
Oil is visible in sight glass on back of tank					
Disconnect switches are fully closed					
Cable riser terminators DO NOT leak fluid					
R132 OCB Feeder			**RATING: 0 1 2 3 4**	**(Circle One)**	
Emergency trip switch is labeled and painted red					
Control door is clearly labeled R132 OCB					
Position indicator displays the "Closed" position					
Charged/Discharged flag is clearly visible					
Emergency trip reset "69" switch is labeled & reset					
Cabinet light works					
Cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					
Bushing oil is halfway up the sight glass					
No leaks from main tank or valves					
Record operation counter and update card					
Oil is visible in sight glass on back of tank					
Disconnect switches are fully closed					
Cable riser terminators DO NOT leak fluid					
R133 OCB Feeder			**RATING: 0 1 2 3 4**	**(Circle One)**	
Emergency trip switch is labeled and painted red					
Control door is clearly labeled R133 OCB					
Position indicator displays the "Closed" position					
Charged/Discharged flag is clearly visible					
Emergency trip reset "69" switch is labeled & reset					
Cabinet light works					
Cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					
Bushing oil is halfway up the sight glass					
No leaks from main tank or valves					
Record operation counter and update card					
Oil is visible in sight glass on back of tank					
Disconnect switches are fully closed					
Cable riser terminators DO NOT leak fluid					

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
1334 OCB			**RATING: 0 1 2 3 4**	**(Circle One)**	
Emergency trip switch is labeled and painted red					
Control door is clearly labeled 1334 OCB					
Position indicator displays the "Closed" position					
Charged/Discharged flag is clearly visible					
Emergency trip reset "69" switch is labeled & reset					
Cabinet light works					
Cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					
Bushing oil is halfway up the sight glass					
No leaks from main tank or valves					
Record operation counter and update card					
Oil is visible in sight glass on back of tank					
Disconnect switches are fully closed					
R134 OCB Feeder			**RATING: 0 1 2 3 4**	**(Circle One)**	
Emergency trip switch is labeled and painted red					
Control door is clearly labeled R134 OCB					
Position indicator displays the "Closed" position					
Charged/Discharged flag is clearly visible					
Emergency trip reset "69" switch is labeled & reset					
Cabinet light works					
Cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					
Bushing oil is halfway up the sight glass					
No leaks from main tank or valves					
Record operation counter and update card					
Oil is visible in sight glass on back of tank					
Disconnect switches are fully closed					
Cable riser terminators DO NOT leak fluid					
R135 OCB Feeder			**RATING: 0 1 2 3 4**	**(Circle One)**	
Emergency trip switch is labeled and painted red					
Control door is clearly labeled R135 OCB					
Position indicator displays the "Closed" position					
Charged/Discharged flag is clearly visible					
Emergency trip reset "69" switch is labeled & reset					
Cabinet light works					
Cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					
Bushing oil is halfway up the sight glass					
No leaks from main tank or valves					
Record operation counter and update card					
Oil is visible in sight glass on back of tank					
Disconnect switches are fully closed					
Cable riser terminators DO NOT leak fluid					

	Good	Bad	COMMENTS	DATE CORRECTED	CORRECTED BY
	X	X			
R136 OCB Feeder			**RATING: 0 1 2 3 4**	**(Circle One)**	
Emergency trip switch is labeled and painted red					
Control door is clearly labeled R136 OCB					
Position indicator displays the "Closed" position					
Charged/Discharged flag is clearly visible					
Emergency trip reset "69" switch is labeled & reset					
Cabinet light works					
Cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					
Bushing oil is halfway up the sight glass					
No leaks from main tank or valves					
Record operation counter and update card					
Oil is visible in sight glass on back of tank					
Disconnect switches are fully closed					
Cable riser terminators DO NOT leak fluid					
Yard & Fence			**RATING: 0 1 2 3 4**	**(Circle One)**	
Four flood lights operate when switch on NW light is on					
Fire extinguisher is mounted on the fence and charged					
The fence is secure from unauthorized entry					
The fence ground connections are intact					
The structural steel is free of bird and insect nests					
Site base and grade is free of vegetation and water					
Warning signs are properly mounted on the fence					
125 VDC Battery			**RATING: 0 1 2 3 4**	**(Circle One)**	
DC ammeter reads between 1 and 3 amps					
DC voltmeter on the charger measures 60 volts with the GRD TEST switch in + position					
DC voltmeter on the charger measures 60 volts with the GRD TEST switch in - position					
Liquid level in cells 1 - 58 is between LOW & HIGH level					
A full bottle with a current expiration date is available					
Face shield and specific gravity tester is available					
Specific gravity in the test cell is 1.200 after corrected					
NO sign of electrolyte leaks from the cells					
NO sign of corrosion on the intercell straps					
Float voltage on the charger and measured from the battery rack is 130.5 volts					
Panel A			**RATING: 0 1 2 3 4**	**(Circle One)**	
Record targets and reset					
Record B-102 watt & vars from panel meters (panel 1)					
Using B-102 PWTS W test switch record pilot wire mA using lower scale with test switch handle pulled out					
Panel B			**RATING: 0 1 2 3 4**	**(Circle One)**	
Record targets and reset					
Panel C			**RATING: 0 1 2 3 4**	**(Circle One)**	
Record targets and reset					
Record D-104 watt & vars from panel meters (panel 1)					
Using D-104 PWTS W test switch record pilot wire mA using lower scale with test switch handle pulled out					
Verify pilot wire monitoring ammeter is between .7 & 1.1 mA					

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
Panel D, E, F			**RATING: 0 1 2 3 4**	**(Circle One)**	
Record targets and reset					
TCO knife switch for 1334 79 is open					
SCADA Cabinet			**RATING: 0 1 2 3 4**	**(Circle One)**	
"ILEX" is displayed on LED display					
D1, D1, D4 LEDs flash sequentially					
Panel 4			**RATING: 0 1 2 3 4**	**(Circle One)**	
Record targets and reset					
Sect 3 87S3 IND RL Red Lamp is lit					
Sect 3 86S3LOR/ER lockout relay is in "Black" reset position					
Sect 4 87S4 IND RL Red Lamp is lit					
Sect 4 86S4 LOR/ER lockout relay is in "Black" reset position					
Panel 3			**RATING: 0 1 2 3 4**	**(Circle One)**	
Record targets and reset					
Red Lamps are lit for the following:					
Bus 1 87B1 IND RL					
Sect 3 5153X IND RL					
Sect 4 5154X IND RL					
The following LOR/ER switches are in "Black" reset position					
86B1, 5153X, 51S4X					
Panel 2			**RATING: 0 1 2 3 4**	**(Circle One)**	
All annunicator lamps light when press "Test" switch					
Red Lamps are lit above the following switches					
399 101 SW; 366 101 SW; FDR 131 101 SW; 132 101 SW; 133 101 SW; 134 101 SW					
Green Lamp above 1334 101 SW is lit					
Panel 1			**RATING: 0 1 2 3 4**	**(Circle One)**	
INCON indicators agree with position indicator heads on Bank 3 & 4 LTCs					
Red Lamps are lit above the following switches					
499 101 SW; 466 101 SW; FDR 135 101 SW; FDR 136 101 SW; D-104 101 SW; C-103 101 SW; B-102 101 SW					
The following white line indicator lamps are lit:					
D-104, K-11, B-102					
Control House			**RATING: 0 1 2 3 4**	**(Circle One)**	
The wall clock displays the proper time					
The AC load center breakers do not display trip flags					
The room temperature is between 60 - 80 degrees F.					
NO sign of rodent infestation					
Emergency Contact Directory present & phone dialtone					
Empty waste bin and sweep as required					
Place entry in log book and notify plant operator					

Other:

Operation Counts

Device	Previous	Present	# of Operations
C-103 OCB			
B-102 OCB			
D-104 OCB			
399 SW			
Trans Bank 3 LTC			
366 SW			
FDR 131 OCB			
FDR 132 OCB			
FDR 133 OCB			
1334 OCB			
499 SW			
Trans Bank 4 LTC			
466 SW			
FDR 134 OCB			
FDR 135 OCB			
FDR 136 OCB			
221 GCB			

Trans. Bank #3 Tank Pressure		PSIG	
Trans. Bank #3 LTC Pressure		PSIG	
Trans. Bank #3 Winding Temp		Degrees C	
Trans. Bank #3 Liquid Temp		Degrees C	
Trans. Bank #3 Tank Oil Level	Low	25C	HIGH
Trans. Bank #3 LTC Oil Level	Low	25C	HIGH
Trans. Bank #4 Tank Pressure		PSIG	
Trans. Bank #4 LTC Pressure		PSIG	
Trans. Bank #4 Winding Temp		Degrees C	
Trans. Bank #4 Liquid Temp		Degrees C	
Trans. Bank #4 Tank Oil Level	Low	25C	HIGH
Trans. Bank #4 LTC Oil Level	Low	25C	HIGH

B-102		MW
B-102		MV
Circulating Current		mA
Local Current		mA
Remote Current		mA
D-104 WATTS		MW
D-104 VARS		MV
Circulating Current		mA
Local Current		mA
Remote Current		mA

Specific Gravity Tests

#1. Read the temperature correction factor off the thermometer (o.oo1 for each 3 deg. Difference from 77 deg. F)
#2. Draw a liquid sample with the syringe and read the specific gravity off the float.
#3. Subtract any negative correction from the third decimal of the specific gravity reading (for example: with a -4 correction at 65 deg F and a specific gravity of 1.213, the corrected specific gravity is 1.209)
#4. If the temperature is above 77 deg F, the correction factor must be added to the specific gravity (for example: with a +4 correction at 89 deg. F and a specific gravity of 1.213, the corrected specific gravity is 1.217)

To Record LTC Operation Count

#1. Press the "ENTER" key on the M-2001 relay in the LTC control cabinet
#2. Press the "UP ARROW" thirteen (13) times
#3. Record the value on the card in the cabinet and on the inspection report
#4. Press the "UP ARROW" until LCD display says "EXIT"
#5. Press the "ENTER" key to turn off the LCD display

LTC VACUUM BOTTLE INTEGRITY TESTS

1 Turn the LOCAL/REMOTE switch to LOCAL.
2 Turn the AUTO/MANUAL switch to MANUAL.
3 Hold the PROTECTION CIRCUIT TEST SW in the TEST position.
4 Hold the RAISE/LOWER switch in the RAISE position.
5 Confirm the LTC runs back to its original step.
6 Confirm that the FAULT indicator lamp lights.
7 Release the PROTECTION CIRCUIT TEST SW.
8 Release the RAISE/LOWER switch.
9 Press the RESET switch.
10 Confirm that the FAULT indicator lamp goes out.
11 Hold the PROTECTION CIRCUIT TEST SW in the TEST position.
12 Hold the RAISE/LOWER switch in the LOWER position.
13 Confirm that the LTC runs back to its original step.
14 Confirm that the FAULT indicator lamp lights.
15 Release the PROTECTION CIRCUIT TEST SW.
16 Release the RAISE/LOWER switch to off.
17 Press the RESET switch.
18 Confirm that the FAULT indicator lamp goes out.
19 Turn AUTO/MANUAL switch to AUTO.
20 Turn LOCAL/REMOTE switch to REMOTE.
21 Reset alarm in control house.
22 Confirm that the plant operator received a transformer major alarm.

Route: Dick Blashka
Kevin Carr
Kim Hackelberg (file)

Rating Criteria: 0 - Perfect Condition
1 - Good Condition, but aging
2 - Non-critical maintenance needed (normally repair within 12 months)
3 - Priority maintenance needed (normally repair within 90 days)
4 - Urgent maintenance needed (report immediately and repair within 1 week)

MPU Northeast Substation - Monthly Inspection Form

INSPECTED BY:

DATE:

TEMPERATURE:

	Good	Bad	COMMENTS	DATE CORRECTED	CORRECTED BY
Transformer Bank #1 Main Tank			**RATING: 0 1 2 3 4**	**(Circle One)**	
Bushing and arrestor porcelain is not damaged or dirty					
Tank pressure is between 1 & 4 pounds positive					
No oil leaks from main tank, radiators, valves					
Cooling fans work when placed in manual					
Record temperature gauge peaks and reset hands					
Radiator temperature increases from bottom to top					
Bushing oil level is halfway up sight glass					
Tank oil level is halfway between high & low marks					
Transformer Bank #1 LTC			**RATING: 0 1 2 3 4**	**(Circle One)**	
Oil level is halfway between high and low marks					
Record temperature drag hand positions and reset					
Cabinet light works					
Record LTC operation counter & update card					
Record LTC position peaks and reset					
Cabinet heater works below 60 deg F.					
Beckwith LTC backup control Block Raise/Lower lamps display dim rather than bright					
"OK" LED on the M-2001 tap changer control is lit					
No signs of cabinet contamination					
LTC tank pressure between 1&4 pounds positive					
Confirm integrity of the LTC vacuum bottles using the LTC test procedure					
C-103 69 kV Oil Circuit Breaker			**RATING: 0 1 2 3 4**	**(Circle One)**	
Emergency trip switch is labeled and painted red					
Control door is clearly labeled C-103 OCB					
Position indicator displays the "Closed" position					
Charged/Discharged flag is clearly visible					
Emergency trip reset "69" switch is labeled & reset					
Cabinet light works					
Cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					
Red oil gauge on top is visible halfway up the glass					
Bushing oil is halfway up the sight glass					
No leaks from main tank or valves					
Record operation counter and update card					
Power resistor in the C-103 line pot fuse cabinet is warm					
Voltage between CLVO & CLV1 in the line pot fuse cabinet is between 108 & 140 volts					
C-103 OCB Line Side disconnect switch is clearly labeled					
C-103 OCB Line Side disconnect switch is grounded					

Approved

1/01

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
C-103 69 kV Oil Circuit Breaker, Cont.			**RATING: 0 1 2 3 4**	**(Circle One)**	
C-103 OCB Line Side disconnect switches are fully closed and properly aligned					
C-103 OCB Buss Side disconnect switch is clearly labeled					
C-103 OCB Buss Side disconnect switch is grounded					
C-103 OCB Buss Side disconnect switches are fully closed and properly aligned					
K11- 69 kV Oil Circuit Breaker			**RATING: 0 1 2 3 4**	**(Circle One)**	
Emergency trip switch is labeled and painted red					
Control door is clearly labeled K-11 OCB					
Position indicator displays the "Closed" position					
Charged/Discharged flag is clearly visible					
Emergency trip reset "69" switch is labeled & reset					
Cabinet light works					
Cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					
Red oil gauge on top is visible halfway up the glass					
Bushing oil is halfway up the sight glass					
No leaks from main tank or valves					
Record operation counter and update card					
Power resistor in the K-11 line pot fuse cabinet is warm					
Voltage between CLVO & CLV1 in the line pot fuse cabinet is between 108 & 140 volts					
K-11 OCB Line Side disconnect switch is clearly labeled					
K-11 OCB Line Side disconnect switch is grounded					
K-11 OCB Line Side disconnect switches are fully closed and properly aligned					
K-11 OCB Buss Side disconnect switch is clearly labeled					
K-11 OCB Buss Side disconnect switch is grounded					
K-11 OCB Buss Side disconnect switches are fully closed and properly aligned					
69 kV Buss and PT			**RATING: 0 1 2 3 4**	**(Circle One)**	
Porcelain bushing, buss supports, and switch posts are not damaged or dirty					
Oil level in primary bushing is between High & Low					
Voltages between fuses of ground in the 69 kV Bus Pot fuse box are between 108 & 132 or 62 & 76 volts					
69 kV Bus Tie disconnect switch is clearly labeled					
69 kV Bus Tie disconnect switch is grounded					
69 kV Bus Tie disconnect switches are fully closed and properly aligned					
69 kV 199 Disconnect Switch			**RATING: 0 1 2 3 4**	**(Circle One)**	
199 Disconnect switch is clearly labeled and grounded					
199 Disconnect switches are fully closed & aligned					
Porcelain insulators & supports are not damaged or dirty					

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
69 kV Circuit Switcher			**RATING: 0 1 2 3 4**	**(Circle One)**	
Position indicator labeling and external position indicator displays the appropriate OPEN/CLOSED position					
Control door is clearly labeled "199 Circuit Switcher"					
The Remote/Local switch is in REMOTE					
Record operations counter and update card					
Cabinet heaters work					
Cabinet is free from contamination					
UPPER end of interrupters do not display a "Lower Pressure" red target					
Manual trip lever is clearly labeled					
Yellow "Charged" flag is clearly visible					
Louvers and Vents are free of dust and debris					
166 Switch & 13.2 kV Buss			**RATING: 0 1 2 3 4**	**(Circle One)**	
166 disconnect switch is clearly labeled and grounded					
166 disconnect switches are fully closed & aligned					
Porcelain insulators & supports are not damaged or dirty					
Reclosers & Feeder Cables			**RATING: 0 1 2 3 4**	**(Circle One)**	
"Red" indicator flag & "Yellow" handle are in up position					
Silver Ball is halfway up oil sight window					
Cable riser terminators are not leaking fluid					
Porcelain insulators & bushings are not damaged or dirty					
Disconnect switches are fully closed and properly aligned					
Yard & Fence			**RATING: 0 1 2 3 4**	**(Circle One)**	
Four flood lights operate when the breakers in the Control House are turned on					
Fire extinguisher is mounted on the fence and charged					
The fence is secure from unauthorized entry					
The fence ground connections are intact					
The structural steel is free of bird and insect nests					
Site base and grade is free of vegetation and water					
Warning signs are properly mounted on the fence					
N132 Control Cabinet			**RATING: 0 1 2 3 4**	**(Circle One)**	
Battery current between -10.0 and -16.0 mA					
Battery voltage between 27 and 29 volts					
Battery voltage drops less than 3 volts when test button is pressed					
Control date and time accurate (codes 154, 155)					
Update counter card (code 39)					
Enter phase and ground courts on card (codes 32-35)					
The LCD windows display the following:					
Check battery is CLEAR					
AC supply is ACTIVE					
Malfunction is CLEAR					
Current above min trip is CLEAR					
Closed is ACTIVE					
Open is CLEAR					

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
N133 Control Cabinet			**RATING: 0 1 2 3 4**	**(Circle One)**	
Battery current between -10.0 and -16.0 mA					
Battery voltage between 27 and 29 volts					
Battery voltage drops less than 3 volts when test button is pressed					
Control date and time accurate (codes 154, 155)					
Update counter card (code 39)					
Enter phase and ground courts on card (codes 32-35)					
The LCD windows display the following:					
Check battery is CLEAR					
AC supply is ACTIVE					
Malfunction is CLEAR					
Current above min trip is CLEAR					
Closed is ACTIVE					
Open is CLEAR					
Panel W1			**RATING: 0 1 2 3 4**	**(Circle One)**	
DTR lamp is lit on the RFL Relay Communication Switch CPU unit					
The +5v, +15v, and -15v green lamps are lit on the RFL Relay Communication Switch 125 DC volts unit					
K-11 50 BF RAICA breaker fail target is reset					
K-11 21P MDAR relay yellow "inservice" is lit					
K-11 21B SEL-221F "Red" EN lamp is lit					
C-103 50 BF RAICA breaker fail target is reset					
C-103 21P MDAR relay yellow "in service" is lit					
C-103 21B SEL-221F "Red" EN lamp is lit					
Panel W2			**RATING: 0 1 2 3 4**	**(Circle One)**	
87S1 Section 1 RADSB Differential Relay target is reset					
86S1 Section 1 DC IND red lamp is lit					
Section 1 86S1 LOR/ER lockout relay is "Black" reset pos					
Section 1 51S1 MMCO "Yellow" monitor lamp is lit					
51S1XC Section 1 DC IND "Red" lamp is lit					
Panel E5			**RATING: 0 1 2 3 4**	**(Circle One)**	
Processor Unit 1 DC Power & PC "Green" lamps are lit					
Processor Unit 1 CPU fault, Battery Low, & Forced I/O red lamps are NOT lit					
Panel E4			**RATING: 0 1 2 3 4**	**(Circle One)**	
Buss 1 A,B,C phase 87B1 SBD-11 buss differential relay target displays in Reset position					
"Red" Buss 1 86B1 DC IND lamp is lit					
Buss 1 86B1 LOR/ER lockout relay is in "Black" reset position					
Panel E2			**RATING: 0 1 2 3 4**	**(Circle One)**	
INCON position indicator matches the LTC indicator					
The "Yellow" XFMR B1 Auto Indication lamp is lit					
199 Breaker control "Red" lamp is lit					
"Red" FDR N132 lamp is lit					
"Red" FDR N133 lamp is lit					
Using the digital panel meter verify the 13.2 kV bus voltage is between 111.5 & 114.5 volts					

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
Panel E1			**RATING: 0 1 2 3 4**	**(Circle One)**	
Note any annunicator alarms & acknowledge					
Panalarm "Red" power on panel is lit					
All white panels light up when pressing "Lamp Test"					
All white panels light up when pressing "Test"					
All white panels go out when "ACK" is pressed					
Confirm the Plant Operator received the following alarms:					
Transformer major, Substation major, Feeder Lockout					
Substation Minor, Switching Device, PC Failure,					
Protective Device, LTC voltage limit					
Synchroscope stops new 12:00 when C-103 S.S. is on					
Synchroscope stops new 12:00 when K-11 S.S. is on					
C-103 white indicator light is lit					
K-11 white indicator light is lit					
C-103 25 CVX Synchro-verifier relay target is reset					
K-11 25 CVX Synchro-verifier relay target is reset					
Battery			**RATING: 0 1 2 3 4**	**(Circle One)**	
The DC ammeter reads about 5 amps					
The DC voltmeter on the charger measures 60 volts with the GRD TEST switch in + position					
The DC voltmeter on the charger measures 60 volts with the GRD TEST switch in - position					
The liquid level in cells 1 - 58 is between LOW & HIGH level					
A full bottle with a current expiration date is available					
The face shield and specific gravity tester is available					
The specific gravity in the test cell is 1.200 after corrected					
NO sign of electrolyte leaks from the cells					
NO sign of corrosion on the intercell straps					
The float voltage on the charger and measured from the battery rack is 130.5 volts					
Control House / General			**RATING: 0 1 2 3 4**	**(Circle One)**	
The wall clock displays the proper time					
The AC load center breakers do not display trip flags					
The room temperature is between 60 - 80 degrees F.					
NO sign of rodent infestation					
Emergency Contact Directory present & phone dialtone					
Empty waste bin and sweep as required					
Place entry in log book and notify plant operator					

Other:

Operation Counts

	Previous	Present	of Operations
C-103 OCB			
K-11 OCB			
199 Circuit Switcher			
N132 Operations Counter			
N132 Target Counter GROUND			
N132 Target Counter PHASE 1-2 "A"			
N132 Target Counter PHASE 3-4 "B"			
N132 Target Counter PHASE 5-6 "C"			
N133 Operations Counter			
N133 Target Counter GROUND			
N133 Target Counter PHASE 1-2 "A"			
N133 Target Counter PHASE 3-4 "B"			
N133 Target Counter PHASE 5-6 "C"			
Trans Bank 1 LTC			

Trans. Bank #1 Tank Pressure _____ PSIG

Trans. Bank #1 Winding Temp _____ Degree C spot _____ Degree C Max

Trans. Bank #1 Liquid Temp _____ Degree C spot _____ Degree C Max

Trans. Bank #1 Tank Oil Level Low 25C HIGH

Trans. Bank #1 LTC Oil Level Low 25C HIGH

Trans. Bank #1 LTC Limits: _____ Maximum

_____ Spot

_____ Minimum

Specific Gravity Tests

#1. Read the temperature correction factor off the thermometer (o.oo1 for each 3 deg. Difference from 77 deg. F)
#2. Draw a liquid sample with the syringe and read the specific gravity off the float.
#3. Subtract any negative correction from the third decimal of the specific gravity reading (for example: with a -4 correction at 65 deg F and a specific gravity of 1.213, the corrected specific gravity is 1.209)
#4. If the temperature is above 77 deg F, the correction factor must be added to the specific gravity (for example: with a +4 correction at 89 deg. F and a specific gravity of 1.213, the corrected specific gravity is 1.217)

To Record LTC Operation Count

#1. Press the "ENTER" key on the M-2001 relay in the LTC control cabinet
#2. Press the "UP ARROW" thirteen (13) times
#3. Record the value on the card in the cabinet and on the inspection report
#4. Press the "UP ARROW" until LCD display says "EXIT"
#5. Press the "ENTER" key to turn off the LCD display

1 Turn the LOCAL/REMOTE switch to LOCAL.
2 Turn the AUTO/MANUAL switch to MANUAL.
3 Hold the PROTECTION CIRCUIT TEST SW in the TEST position.
4 Hold the RAISE/LOWER switch in the RAISE position.
5 Confirm the LTC runs back to its original step.
6 Confirm that the FAULT indicator lamp lights.
7 Release the PROTECTION CIRCUIT TEST SW.
8 Release the RAISE/LOWER switch.
9 Press the RESET switch.
10 Confirm that the FAULT indicator lamp goes out.
11 Hold the PROTECTION CIRCUIT TEST SW in the TEST position.
12 Hold the RAISE/LOWER switch in the LOWER position.
13 Confirm that the LTC runs back to its original step.
14 Confirm that the FAULT indicator lamp lights.
15 Release the PROTECTION CIRCUIT TEST SW.
16 Release the RAISE/LOWER switch to off.
17 Press the RESET switch.
18 Confirm that the FAULT indicator lamp goes out.
19 Turn AUTO/MANUAL switch to AUTO.
20 Turn LOCAL/REMOTE switch to REMOTE.
21 Reset alarm in control house.
22 Confirm that the plant operator received a transformer major alarm.

Route: Dick Blashka
Kevin Carr
Kim Hackelberg (file)

Rating Criteria: 0 - Perfect Condition
1 - Good Condition, but aging
2 - Non-critical maintenance needed (normally repair within 12 months)
3 - Priority maintenance needed (normally repair within 90 days)
4 - Urgent maintenance needed (report immediately and repair within 1 week)

MPU Lakefront Substation - Monthly Inspection Form

INSPECTED BY:

DATE:

TEMPERATURE:

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
Plant Tie Transformer Main Tank			**RATING: 0 1 2 3 4**	**(Circle One)**	
Tank oil level is halfway between high and low marks					
Bushing and arrestor porcelain is not damaged or dirty					
Tank pressure is between 1 & 4 pounds positive					
No oil leaks from main tank, radiators, valves					
Cooling fans work when placed in manual					
Record temperature gauge peaks and reset hands					
Radiator temperature increases from bottom to top					
Bushing oil level is halfway up sight glass					
Control Power Breakers are ON					
Cooling fans on if winding temp greater than 80 deg F					
Oil pumps on if winding temp greater than 85 deg F					
Plant Tie Transformer LTC			**RATING: 0 1 2 3 4**	**(Circle One)**	
Oil level is halfway between high and low marks					
Record temperature drag hand positions and reset					
Cabinet light works					
Record LTC operation counter & update card					
Record LTC position peaks and reset					
Cabinet heater works below 60 deg F.					
No signs of cabinet contamination					
LTC tank pressure between 1&4 pounds positive					
69 kV Plant Tie OCB			**RATING: 0 1 2 3 4**	**(Circle One)**	
Emergency trip switch is labeled and painted red					
Control door is clearly labeled Plant Tie OCB					
Position indicator displays the "Closed" position					
Charged/Discharged flag is clearly visible					
Emergency trip reset "69" switch is labeled & reset					
Cabinet light works					
Cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					
Red oil gauge on top is visible halfway up the glass					
Bushing oil is halfway up the sight glass					
No leaks from main tank or valves					
Record operation counter and update card					
Plant Tie OCB Line Side disconnect switch is clearly labeled					
Plant Tie OCB Line Side disconnect switch is grounded					
Plant Tie OCB Line Side disconnect switches are fully closed and properly aligned					
Plant Tie OCB Bus Side disconnect switch is clearly labeled					
Plant Tie OCB Bus Side disconnect switch is grounded					

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
69 kV Plant Tie OCB, Cont.			**RATING: 0 1 2 3 4**	**(Circle One)**	
Plant Tie OCB Bus Side disconnect switches are fully closed and properly aligned					
Plant Tie BYPASS DISCONNECT SWITCH is clearly labeled					
Plant Tie BYPASS DISCONNECT SWITCH is grounded					
Plant Tie BYPASS DISCONNECT SWITCHES are fully opened					
Gen #5 Transformer Main Tank			**RATING: 0 1 2 3 4**	**(Circle One)**	
Tank oil level is halfway between high and low marks					
Bushing and arrestor porcelain is not damaged or dirty					
Tank pressure is between 1 & 4 pounds positive					
No oil leaks from main tank, radiators, valves					
Cooling fans work when placed in manual					
Record temperature gauge peaks and reset hands					
Radiator temperature increases from bottom to top					
Bushing oil level is halfway up sight glass					
Control Power Breakers are ON					
Cooling fans on if winding temp greater than 80 deg F					
Oil pumps on if winding temp greater than 85 deg F					
Lockout Relay and target in cabinet are in black reset position					
69 kV Gen #5 OCB			**RATING: 0 1 2 3 4**	**(Circle One)**	
Emergency trip switch is labeled and painted red					
Control door is clearly labeled Gen #5 OCB					
Position indicator displays the "Closed" position					
Charged/Discharged flag is clearly visible					
Emergency trip reset "69" switch is labeled & reset					
Cabinet light works					
Cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					
Red oil gauge on top is visible halfway up the glass					
Bushing oil is halfway up the sight glass					
No leaks from main tank or valves					
Record operation counter and update card					
Gen #5 OCB Line Side disconnect switch is clearly labeled					
Gen #5 OCB Line Side disconnect switch is grounded					
Gen #5 OCB Line Side disconnect switches are fully closed and properly aligned					
Gen #5 OCB Bus Side disconnect switch is clearly labeled					
Gen #5 OCB Bus Side disconnect switch is grounded					
Gen #5 OCB Bus Side disconnect switches are fully closed and properly aligned					
Gen #5 BYPASS DISCONNECT SWITCH is clearly labeled					
Gen #5 BYPASS DISCONNECT SWITCH is grounded					
Gen #5 BYPASS DISCONNECT SWITCHES are fully opened					

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
Grounding Transformer Main Tank			**RATING: 0 1 2 3 4**	**(Circle One)**	
Tank oil level is halfway between high and low marks					
Bushing and arrestor porcelain is not damaged or dirty					
Tank pressure is between 1 & 4 pounds positive					
No oil leaks from main tank, radiators, valves					
Cooling fans work when placed in manual					
Record temperature gauge peaks and reset hands					
Radiator temperature increases from bottom to top					
Bushing oil level is halfway up sight glass					
Control Power Breakers are ON					
Lockout Relay and target in cabinet are in black reset position					
69 kV Grounding OCB			**RATING: 0 1 2 3 4**	**(Circle One)**	
Emergency trip switch is labeled and painted red					
Control door is clearly labeled Grounding OCB					
Position indicator displays the "Closed" position					
Charged/Discharged flag is clearly visible					
Emergency trip reset "69" switch is labeled & reset					
Cabinet light works					
Cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					
Red oil gauge on top is visible halfway up the glass					
Bushing oil is halfway up the sight glass					
No leaks from main tank or valves					
Record operation counter and update card					
Grounding OCB Line Side disconnect switch is clearly labeled					
Grounding OCB Line Side disconnect switch is grounded					
Grounding OCB Line Side disconnect switches are fully closed and properly aligned					
Grounding OCB Bus Side disconnect switch is clearly labeled					
Grounding OCB Bus Side disconnect switch is grounded					
Grounding OCB Bus Side disconnect switches are fully closed and properly aligned					
Grounding BYPASS DISCONNECT SWITCH is clearly labele					
Grounding BYPASS DISCONNECT SWITCH is grounded					
Grounding BYPASS DISCONNECT SWITCHES are fully opened					
69 kV Transfer OCB			**RATING: 0 1 2 3 4**	**(Circle One)**	
Emergency trip switch is labeled and painted red					
Control door is clearly labeled Transfer OCB					
Position indicator displays the "Closed" position					
Charged/Discharged flag is clearly visible					
Emergency trip reset "69" switch is labeled & reset					
Cabinet light works					
Cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					
Red oil gauge on top is visible halfway up the glass					
Bushing oil is halfway up the sight glass					
No leaks from main tank or valves					
Record operation counter and update card					
Transfer OCB Line Side disconnect switch is clearly labeled					
Transfer OCB Line Side disconnect switch is grounded					
Transfer OCB Line Side disconnect switches are fully closed and properly aligned					

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
69 kV Transfer OCB, Cont.			**RATING: 0 1 2 3 4**	**(Circle One)**	
Transfer OCB Bus Side disconnect switch is clearly labeled					
Transfer OCB Bus Side disconnect switch is grounded					
Transfer OCB Bus Side disconnect switches are fully closed and properly aligned					
69 kV D-104 OCB			**RATING: 0 1 2 3 4**	**(Circle One)**	
Emergency trip switch is labeled and painted red					
Control door is clearly labeled D-104 OCB					
Position indicator displays the "Closed" position					
Charged/Discharged flag is clearly visible					
Emergency trip reset "69" switch is labeled & reset					
Cabinet light works					
Cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					
Red oil gauge on top is visible halfway up the glass					
Bushing oil is halfway up the sight glass					
No leaks from main tank or valves					
Record operation counter and update card					
D-104 OCB Line Side disconnect switch is clearly labeled					
D-104 OCB Line Side disconnect switch is grounded					
D-104 OCB Line Side disconnect switches are fully closed and properly aligned					
D-104 OCB Bus Side disconnect switch is clearly labeled					
D-104 OCB Bus Side disconnect switch is grounded					
D-104 OCB Bus Side disconnect switches are fully closed and properly aligned					
D-104 BYPASS DISCONNECT SWITCH is clearly labeled					
D-104 BYPASS DISCONNECT SWITCH is grounded					
D-104 BYPASS DISCONNECT SWITCHES are fully opened					
Oil in line PT Bushing is halfway between High & Low					
69 kV A-101 OCB			**RATING: 0 1 2 3 4**	**(Circle One)**	
Emergency trip switch is labeled and painted red					
Control door is clearly labeled A-101 OCB					
Position indicator displays the "Closed" position					
Charged/Discharged flag is clearly visible					
Emergency trip reset "69" switch is labeled & reset					
Cabinet light works					
Cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					
Red oil gauge on top is visible halfway up the glass					
Bushing oil is halfway up the sight glass					
No leaks from main tank or valves					
Record operation counter and update card					
A-101 OCB Line Side disconnect switch is clearly labeled					
A-101 OCB Line Side disconnect switch is grounded					
A-101 OCB Line Side disconnect switches are fully closed and properly aligned					
A-101 OCB Bus Side disconnect switch is clearly labeled					
A-101 OCB Bus Side disconnect switch is grounded					
A-101 OCB Bus Side disconnect switches are fully closed and properly aligned					
A-101 BYPASS DISCONNECT SWITCH is clearly labeled					
A-101 BYPASS DISCONNECT SWITCH is grounded					

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
69 kV A-101 OCB, Cont.			**RATING: 0 1 2 3 4**	**(Circle One)**	
A-101 BYPASS DISCONNECT SWITCHES are fully opened					
Air Pressure Gauge is between 130 & 160 PSI					
Compressor runs less than 2 hours per month (update card)					
69 kV Buss & Buss PT			**RATING: 0 1 2 3 4**	**(Circle One)**	
Oil in bushings is halfway between High & Low					
Bushing and arrestor porcelain is not damaged or dirty					
Yard & Fence			**RATING: 0 1 2 3 4**	**(Circle One)**	
East flood light operates by switch on pole					
Fire extinguisher is mounted on the fence and charged					
The fence is secure from unathorized entry					
The fence ground connections are intact					
The structural steel is free of bird and insect nests					
Site base and grade is free of vegetation and water					
Warning signs are properly mounted on the fence					

Other:

Operation Counts

	Previous	Present	# of Operations
69 kV Plant Tie LTC			
D-104 OCB			
Gen #5 Transformer OCB			
Plant Tie OCB			
Grounding Transformer OCB			
Transfer OCB			
A-101 OCB			

Gen #5 Trans. Tank Pressure		PSIG		
Gen #5 Trans. Liquid Temp.		Degree C spot		Degree C Max
Gen #5 Trans. Winding Temp.		Degree C spot		Degree C Max
Gen #5 Trans. Tank Oil Level	Low	25C	HIGH	
Grounding Trans. Tank Pressure		PSIG		
Grounding Trans. Liquid Temp.		Degree C spot		Degree C Max
Grounding Trans. Tank Oil Level	Low	25C	HIGH	
Plant Trans. Liquid Temp.		Degree C spot		Degree C Max
Plant Tie Trans. Winding Temp.		Degree C spot		Degree C Max
Plant Tie Trans. Tank Oil Level	Low	25C	HIGH	
Plant Tie Trans. LTC Oil Level	Low	25C	HIGH	
Plant Tie Trans. Tank Pressure		PSIG		
Plant Tie Trans. LTC Pressure		PSIG		

Route: Dick Blashka
, Kevin Carr
Kim Hackelberg (file)

Rating Criteria: 0 - Perfect Condition
1 - Good Condition, but aging
2 - Non-critical maintenance needed (normally repair within 12 months)
3 - Priority maintenance needed (normally repair within 90 days)
4 - Urgent maintenance needed (report immediately and repair within 1 week)

MPU Mirro Substation - Monthly Inspection Form

INSPECTED BY:

DATE:

TEMPERATURE:

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
199 Disconnect Switch			**RATING: 0 1 2 3 4**	**(Circle One)**	
199 Disconnect switch is clearly labeled and grounded					
199 Disconnect switches are fully closed & aligned					
Porcelain insulators & supports are not damaged or dirty					
Power fuses are fully closed and aligned					
Transformer Bank #1			**RATING: 0 1 2 3 4**	**(Circle One)**	
Tank oil level is halfway between high and low marks					
Record temperature gauge peaks and reset drag hands					
Bushing and arrestor porcelain is not damaged or dirty					
Radiator temperature increases from bottom to top					
Tank pressures are between 1 and 4 pounds positive					
No oil leaks from main tanks radiators, valves					
East Yard & Fence			**RATING: 0 1 2 3 4**	**(Circle One)**	
Fire extinguisher is mounted on the fence and charged					
The fence is secure from unathorized entry					
The fence ground connections are intact					
The structural steel is free of bird and insect nests					
Site base and grade is free of vegetation and water					
Warning signs are properly mounted on the fence					
Control Power Transformer			**RATING: 0 1 2 3 4**	**(Circle One)**	
Bushings are not damaged or dirty					
Fuse cutouts are fully closed and secure					
Bushings and main tank is clear of bird and insect nests					
4 kV Buss & PTs			**RATING: 0 1 2 3 4**	**(Circle One)**	
Porcelain bushings are not damaged or dirty					
Buss work is clear of bird and insect nests					
Grounding resistor is clear of bird and insect nests					
299 Disconnect Switch			**RATING: 0 1 2 3 4**	**(Circle One)**	
299 Disconnect switch is clearly labeled and grounded					
299 Disconnect switches are fully closed & aligned					
Porcelain insulators & supports are not damaged or dirty					
Power fuses are fully closed and aligned					

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
Transformer Bank #2 Main Tank			**RATING: 0 1 2 3 4**	**(Circle One)**	
Tank oil level is halfway between high and low marks					
Record temperature gauge peaks and reset drag hands					
Bushing and arrestor porcelain is not damaged or dirty					
Radiator temperature increases from bottom to top					
Tank pressures are between 1 and 4 pounds positive					
No oil leaks from main tanks radiators, valves					
Oil is halfway up bushing sight glass					
Cooling fans work when placed in Manual					
Transformer Bank #2 LTC			**RATING: 0 1 2 3 4**	**(Circle One)**	
Door is labeled transformer Bank #2 LTC					
LTC Tank oil level is between High & Low					
Verify LTC is in neutral pos. & Raise/Lower switch is OFF					
Cabinet light works					
Cabinet heater works below 60 deg F.					
No signs of cabinet contamination					
LTC Tank pressure between 1 and 4 pounds positive					
Record temperature drag hands and reset					
Record LTC position peaks and reset					
Record LTC operation counter and update card					
399 Disconnect Switch			**RATING: 0 1 2 3 4**	**(Circle One)**	
399 Disconnect switch is clearly labeled and grounded					
399 Disconnect switches are fully closed & aligned					
Porcelain insulators & supports are not damaged or dirty					
Power fuses are fully closed and aligned					
Transformer Bank #3 Main Tank			**RATING: 0 1 2 3 4**	**(Circle One)**	
Tank oil level is halfway between high and low marks					
Record temperature gauge peaks and reset drag hands					
Bushing and arrestor porcelain is not damaged or dirty					
Radiator temperature increases from bottom to top					
Tank pressures are between 1 and 4 pounds positive					
No oil leaks from main tanks radiators, valves					
Oil is halfway up bushing sight glass					
Cooling fans work when placed in Manual					
SCADA RTU Cabinet			**RATING: 0 1 2 3 4**	**(Circle One)**	
Cabinet heater is warm below 60 deg F					
Cabinet does not show signs of internal moisture					
Cabinet is free of contamination					
AC load center breakers have no flags					
The D1, D2, D4 LEDs flash sequentially					
West Yard and Fence			**RATING: 0 1 2 3 4**	**(Circle One)**	
Fire extinguisher is mounted on the fence and charged					
The fence is secure from unathorized entry					
The fence ground connections are intact					
The structural steel is free of bird and insect nests					
Site base and grade is free of vegetation and water					
Warning signs are properly mounted on the fence					

Other:

	HV1153			HV1152		
Bank #1 Tank Pressure		PSIG			PSIG	
Bank #1 Oil Temperature		°C			°C	
Bank #1 Oil Level	Low	25C	HIGH	Low	25C	HIGH

	HV1151			HV1150		
Bank #1 Tank Pressure		PSIG			PSIG	
Bank #1 Oil Temperature		°C			°C	
Bank #1 Oil Level	Low	25C	HIGH	Low	25C	HIGH

Bank #2 Tank Pressure		PSIG	
Bank #2 Oil Temperature		°C	
Bank #2 Oil Level	Low	25C	HIGH
Bank #2 LTC Oil Level	Low	25C	HIGH

Bank #3 Tank Pressure		PSIG	
Bank #3 Oil Temperature		°C	
Bank #3 Oil Level	Low	25C	HIGH

Route: Dick Blashka
Kevin Carr
Kim Hackelberg (file)

Rating Criteria: 0 - Perfect Condition
1 - Good Condition, but aging
2 - Non-critical maintenance needed (normally repair within 12 months)
3 - Priority maintenance needed (normally repair within 90 days)
4 - Urgent maintenance needed (report immediately and repair within 1 week)

MPU Rapids Substation - Monthly Inspection Form

INSPECTED BY:

DATE:

TEMPERATURE:

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
69 kV B-102 OCB			**RATING: 0 1 2 3 4**	**(Circle One)**	
Emergency trip switch is labeled and painted red					
Control door is clearly labeled B-102 OCB					
Position indicator displays the "Closed" position					
Charged/Discharged flag is clearly visible					
Emergency trip reset "69" switch is labeled & reset					
Cabinet light works					
Cabinet heater works below 60 deg F.					
Cabinet is free from contamination					
Bushing and arrestor porcelain is not damaged or dirty					
Red oil gauge on top is visible halfway up the glass					
Bushing oil is halfway up the sight glass					
No leaks from main tank or valves					
Record operation counter and update card					
B-102 OCB Line Side disconnect switch is clearly labeled					
B-102 OCB Line Side disconnect switch is grounded					
B-102 OCB Line Side disconnect switches are fully closed and properly aligned					
B-102 OCB Buss Side disconnect switch is clearly labeled					
B-102 OCB Buss Side disconnect switch is grounded					
B-102 OCB Buss Side disconnect switches are fully closed and properly aligned					
Oil level in PT bushings between High & Low marks					
Air Pressure gauge between 130 and 160 psi					
Compressor ran less than 2 hours/month					
Power resistor in the B-102 line PT JCT Box is warm					
Voltage at terminals BLV1 and BLV2 in B-102 line PT JCT box is between 108 and 132 volts					
69 kV Buss and PT			**RATING: 0 1 2 3 4**	**(Circle One)**	
Porcelain bushing, buss supports, and switch posts are not damaged or dirty					
Oil level in primary bushing is between High & Low					
Voltages between fuses of ground in the 69 kV Bus Pot fuse box are between 108 & 132 or 62 & 76 volts					
99 switch is clearly labeled and grounded					
99 switch is fully closed and properly aligned					
Power resistor in PT JCT box is warm					

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
Yard & Fence			**RATING: 0 1 2 3 4**	**(Circle One)**	
Two flood lights work when on					
Fire extinguisher is mounted on the fence and charged					
Fence is secure from unauthorized entry					
Fence ground connections are intact					
Structural steel is free of bird and insect nests					
Site base and grade is free of vegetation and water					
Warning signs are properly mounted on the fence					
Panel N1			**RATING: 0 1 2 3 4**	**(Circle One)**	
Synchroscope stops at 12:00 when on					
White B-102 LINE IND WL Line Potential lamp is lit					
Two RED lamps above B-102 101 switch are lit					
B-102 101 ES control switch DISPLAYS A RED TARGET					
Panel N3			**RATING: 0 1 2 3 4**	**(Circle One)**	
Note annunicator alarms and acknowledge					
All panels light up & flash when press "TEST"					
All panels stop flashing when press "ACK"					
All panel lights go out when press "RESET"					
Panel N4			**RATING: 0 1 2 3 4**	**(Circle One)**	
Bus 1 87B1 PVD Bus differential relay targets display "RESET"					
Bus 1 86B1 IND RL RED LAMP is lit					
Bus 1 86B1 LOR/ER lockout Relay Switch target in "Black" reset position					
SCADA Panel			**RATING: 0 1 2 3 4**	**(Circle One)**	
"ILEX" is displayed on LED display					
D1, D2, D4 LEDs flash sequentially					
Panel S2			**RATING: 0 1 2 3 4**	**(Circle One)**	
Relay targets are reset					
Pilot Wire Readings			**RATING: 0 1 2 3 4**	**(Circle One)**	
Record B-102 WATTS & VARS from digital meter					
Record Pilot Wire mA using B-102 PW TS TEST SWITCH (read mA from lower scale with test switch handle out)					
Verify that the pilot wire Monitoring Ammeter (located in the 74 relay) is between 0.7 and 1.1 mA					

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
Battery			**RATING: 0 1 2 3 4**	**(Circle One)**	
DC ammeter reads about 5 amps					
DC voltmeter on charger measures 60 volts with the GRD TEST switch in + position					
DC voltmeter on charger measures 60 volts with the GRD TEST switch in - position					
Liquid level in cells 1 - 58 is between LOW & HIGH level					
A full bottle with a current expiration date is available					
Face shield and specific gravity tester is available					
Specific gravity in test cell is 1.200 after corrected					
NO sign of electrolyte leaks from the cells					
NO sign of corrosion on the intercell straps					
Float voltage on charger and measured from battery rack is 130.5 volts					
Control House / General			**RATING: 0 1 2 3 4**	**(Circle One)**	
Wall clock displays proper time					
AC load center breakers do not display trip flags					
Room temperature is between 60 - 80 degrees F.					
NO sign of rodent infestation					
Emergency Contact Directory present & phone dialtone					
Empty waste bin and sweep as required					
Place entry in log book and notify plant operator					

Other:

Operation Counts

	Previous	Present	# of Operations
B-102 OCB			

B-102 WATTS	
B-102 VARS	
Circulating Current	
Local Current	
Remote Current	

Specific Gravity Tests

#1. Read the temperature correction factor off the thermometer (o.oo1 for each 3 deg. Difference from 77 deg. F)

#2. Draw a liquid sample with the syringe and read the specific gravity off the float.

#3. Subtract any negative correction from the third decimal of the specific gravity reading (for example: with a -4 correction at 65 deg F and a specific gravity of 1.213, the corrected specific gravity is 1.209)

#4. If the temperature is above 77 deg F, the correction factor must be added to the specific gravity (for example: with a +4 correction at 89 deg. F and a specific gravity of 1.213, the corrected specific gravity is 1.217)

Route: Dick Blashka
, Kevin Carr
Kim Hackelberg (file)

Rating Criteria: 0 - Perfect Condition
1 - Good Condition, but aging
2 - Non-critical maintenance needed (normally repair within 12 months)
3 - Priority maintenance needed (normally repair within 90 days)
4 - Urgent maintenance needed (report immediately and repair within 1 week)

MPU "A" Substation - Monthly Inspection Form

INSPECTED BY:

DATE:

TEMPERATURE:

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
13.2 kV Buss			**RATING: 0 1 2 3 4**	**(Circle One)**	
Porcelain insulators & supports are not damaged or dirty					
Disconnect switches are fuly closed & propery aligned					
Both yard lights operate when switch is ON					
Structural steel is clear of bird and insect nests					
East Transformer Main Tank			**RATING: 0 1 2 3 4**	**(Circle One)**	
Tank oil level is halfway between high and low marks					
Bushing and arrestor porcelain is not damaged or dirty					
Tank pressure is between 1 & 4 pounds positive					
No oil leaks from main tank, radiators, valves					
Cooling fans work when placed in manual					
Record temperature gauge peaks and reset hands					
Radiator temperature increases from bottom to top					
East Transformer LTC			**RATING: 0 1 2 3 4**	**(Circle One)**	
Oil level is halfway between high and low marks					
Record temperature drag hand positions and reset					
Cabinet light works					
Record LTC operation counter & update card					
Record LTC position peaks and reset					
Cabinet heater works below 60 deg F.					
"OK" LED on the M-2001 tap changer control is lit					
No signs of cabinet contamination					
LTC tank pressure between 1&4 pounds positive					
LTC door is labeled "EAST TRANSFORMER LTC"					
Oil level on INERT GAS side of expansion tank is lower than ATMOSPHERE side					
East Aux Compartment - Front			**RATING: 0 1 2 3 4**	**(Circle One)**	
Door is labeled "EAST AUXILIARY"					
Compartment light works					
Compartment heater is warm					
Record any relay targets					
Record voltage for each phase (on back page)					
Charger votlage is between 28 & 30 VDC					
Charger amps is approximately zero					
Compartment is free from contamination					

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
East Comp: Main, 2A, 1A - Front			**RATING: 0 1 2 3 4**	**(Circle One)**	
Compartment doors are clearly labeled					
Compartment lights work					
Appropriate Green/Red breaker position lamps are lit					
Compartment heaters are warm					
Record targets and reset					
Record maximum & spot amps for each phase & reset					
Compartment is free from contamination					
East Comp: Main, 2A, 1A - Rear			**RATING: 0 1 2 3 4**	**(Circle One)**	
OPEN/CLOSED indicator is properly displayed					
Compartment doors are clearly labeled					
Compartment lights work					
Manual trip button is labeled and painted Red					
No leaks from breaker tank					
Update counter card					
Compartment is free from contamination					
East Aux Compartment - Rear			**RATING: 0 1 2 3 4**	**(Circle One)**	
Compartment door is labeled "EAST AUX"					
Compartment lights work					
Control power breaker handle in "ON" position					
PT compartment door is secure					
Compartment is free from contamination					
West Transformer Main Tank			**RATING: 0 1 2 3 4**	**(Circle One)**	
Tank oil level is halfway between high and low marks					
Bushing and arrestor porcelain is not damaged or dirty					
Tank pressure is between 1 & 4 pounds positive					
No oil leaks from main tank, radiators, valves					
Cooling fans work when placed in manual					
Record temperature gauge peaks and reset hands					
Radiator temperature increases from bottom to top					
West Transformer LTC			**RATING: 0 1 2 3 4**	**(Circle One)**	
Oil level is halfway between high and low marks					
Record temperature drag hand positions and reset					
Cabinet light works					
Record LTC operation counter & update card					
Record LTC position peaks and reset					
Cabinet heater works below 60 deg F.					
"OK" LED on the M-2001 tap changer control is lit					
No signs of cabinet contamination					
LTC tank pressure between 1&4 pounds positive					
LTC door is labeled "WEST TRANSFORMER LTC"					
Oil level on INERT GAS side of expansion tank is lower than ATMOSPHERE side					

	Good X	Bad X	COMMENTS	DATE CORRECTED	CORRECTED BY
West Aux Compartment - Front			**RATING: 0 1 2 3 4**	**(Circle One)**	
Door is labeled "WEST AUXILIARY"					
Compartment light works					
Compartment heater is warm					
Record any relay targets					
Record voltage for each phase (on back page)					
Compartment is free from contamination					
West Comp: Main, 5A, 4A, 3A - Front			**RATING: 0 1 2 3 4**	**(Circle One)**	
Compartment doors are clearly labeled					
Compartment lights work					
Appropriate Green/Red breaker position lamps are lit					
Compartment heaters are warm					
Record targets and reset					
Record maximum & spot amps for each phase & reset					
Compartment is free from contamination					
West Comp: Main, 5A, 4A, 3A - Rear			**RATING: 0 1 2 3 4**	**(Circle One)**	
OPEN/CLOSED indicator is properly displayed					
Compartment doors are clearly labeled					
Compartment lights work					
Manual trip button is labeled and painted Red					
No leaks from breaker tank					
Update counter card					
Compartment is free from contamination					
West Aux Compartment - Rear			**RATING: 0 1 2 3 4**	**(Circle One)**	
Compartment door is labeled "WEST AUX"					
Compartment lights work					
Control power breaker handle in "ON" position					
PT compartment door is secure					
Compartment is free from contamination					
Yard & Fence			**RATING: 0 1 2 3 4**	**(Circle One)**	
Fire extinguisher is mounted on the fence and charged					
Fence is secure from unathorized entry					
Fence ground connections are intact					
Structural steel is free of bird and insect nests					
Site base and grade is free of vegetation and water					
Warning signs are properly mounted on the fence					
Security Lights work when switch is on					
24 V Battery			**RATING: 0 1 2 3 4**	**(Circle One)**	
Liquid level is cells 1-12 is between High & Low level					
A full bottle with current experiation date is available					
Face shield and specific gravity tester is available					
Specific gravity is test cell is above 1,200 when corrected					
Heater is warm					
No sign of electrolyte leaks from the cells					
No sign of corrosion on the intercell straps					

Other:

Operation Counts

Device	Previous	Present	Number of Operations
East Trans. LTC			
East Main ACB			
2A ACB			
1A ACB			
West Trans. LTC			
West Main ACB.			
5A ACB			
4A ACB			
3A ACB			

	MAX AMPS			SPOT AMPS		
	A	B	C	A	B	C
East Main						
2A						
1A						
West Main						
5A						
3A						
4A						

	VOLTS		
	A	B	C
East Trans Frt Aux Compartment			
West Trans Frt Aux Compartment			

East Trans Liquid Temperature		MAX		SPOT
East Trans Tank Oil Level	LOW	25C		HIGH
East Trans LTC Oil Level	LOW	25C		HIGH
East Trans Inert Gas Side	LOW	FILL LEVEL		HIGH
East Trans Atmosphere Side	LOW	FILL LEVEL		HIGH
West Trans Liquid Temperature		° C MAX		° C SPOT
West Trans Tank Oil Level	LOW	25C		HIGH
West Trans LTC Oil Level	LOW	25C		HIGH
West Trans Inert Gas Side	LOW	FILL LEVEL		HIGH
West Trans Atmosphere Side	LOW	FILL LEVEL		HIGH

East Trans. LTC Limits: _____ Maximum _____ Spot _____ Minimum

West Trans. LTC Limits: _____ Maximum _____ Spot _____ Minimum

Specific Gravity Tests

#1. Read the temperature corrrection factor off the thermometer (o.oo1 for each 3 deg. Difference from 77 deg. F)

#2. Draw a liquid sample with the syringe and read the specific gravity off the float.

#3. Subtract any negative corrrection from the third decimal of the specific gravity reading (for example: with a -4 correction at 65 deg F and a specific gravity of 1.213, the corrected specific gravity is 1.209)

#4. If the temperature is above 77 deg F, the correction factor must be added to the specific gravity (for example: with a +4 correction at 89 deg. F and a specific gravity of 1.213, the corrected specific gravity is 1.217)

APPENDIX D

Annual Substation Inspection Form

ANNUAL SUBSTATION INSPECTION FORM

Date _____ **Inspected by** _____ **Substation** _____

	SUBSTATION INSPECTION CRITERIA								COMMENTS	MAINTENANCE COMPLETED	
EQUIPMENT LISTING	Check equipment for level	Check condition of concrete pads	Perform oil and DGA analysis	Battery checks - Intercell strap resistance, Individual cell voltages, Cell specific gravity	Nameplate legible	Equipment paint condition	Proper identification labels	IR / RFI scans and checks	Rating Criteria --- 0) Good Condition 1) Good Condition but aging 2) Non-critical Maintenance Required 3) Priority Maintenance Required 4) Urgent Maintenance Required	Date Item Corrected	Corrected By
Transformer											
LTC or regulators											
High Voltage Breaker											
Feeder CBs / Reclosers											
Switches											
Control house battery											
Transmission line RFI											

MEUW - Preventative Maintenance Plan Format

APPENDIX E

Annual Transmission Inspection Form

ANNUAL TRANSMISSION INSPECTION FORM

Date_____ Inspected by_____ Sub_____ Ckt _____

MAP AREA	STRUCTURE												EQUIPMENT		CLEARANCE					COMMENTS		
LOCATION	Pole Condition/Leaning	Crossarm Condition	Insulators, DE, Pin	Soil Conditions	Pole Steps	Grounds Intact, Molding	Down Guys and Markers	Guy Bond, Insulator	Signs, Loc#, Warning	Customer Equipment	Conductor and Ties	RFI Check	Switches	Arresters	Tree Trimming	Ground Line Clearances	Building Clearances	Streets, Roads, Alleys	Communication Clearance	Rating Criteria --- 0) Good Condition 1) Good Condition but aging 2) Non-critical Maintenance Required 3) Priority Maintenance Required 4) Urgent Maintenace Required	Date Item Corrected	Corrected By